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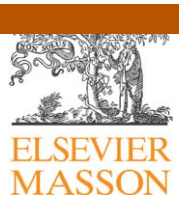

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IMAGE

Cardiac computed tomography in right-sided carcinoid heart disease

Scanner cardiaque dans la cardiopathie carcinoïde droite

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Ileal carcinoid neoplasm with liver metastasis (Panel A, arrows) was diagnosed recently in this 38-year-old man. Surgical treatment had been scheduled, combining ileo-colectomy and liver transplantation. As the patient complained of dyspnoea on exertion, transthoracic echocardiography (TTE) was performed, which revealed massive pulmonary and tricuspid regurgitation. Left ventricular ejection fraction and left-sided valves were normal. Dose-modulated cardiac computed tomography (CT) (VCT Light Speed 64, General Electric, Milwaukee, WI, USA) was performed to eliminate coronary artery disease before surgery (Fig. 1). Coronary arteries were normal. Multiplanar multiphase reconstruction showed enlarged right cavities, and thickening and retraction of the tricuspid valve and subvalvular apparatus, including chordae and papillary muscles (Panels B, C and D). Tricuspid valve closure was incomplete during systole (Panel C, arrow; Video 1). The pulmonary valve was also thickened and non-coapting at diastole (Panels E, F; Video 2). Moderate cardiac effusion was visible (Panel D, arrow). Although the impact of CT was limited for planning the treatment of cardiac carcinoid disease, it provided a comprehensive depiction of the anatomy of the right-sided cavities and pulmonary valve. The limits of CT must be acknowledged: it cannot assess or quantify valve regurgitation, pulmonary artery pressure or patent foramen ovale (PFO). Also, the temporal resolution of CT does not allow detailed assessment of valve motion compared with TTE.

Abbreviations: CT, computed tomography; PFO, patent foramen ovale; TTE, transthoracic echocardiography.

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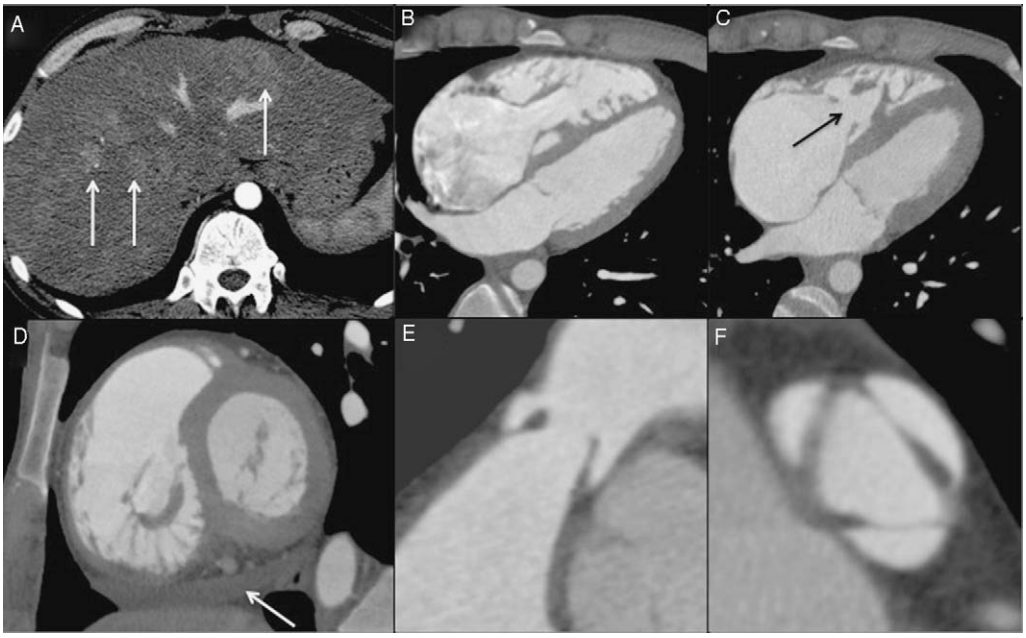

Figure 1. Panel A: abdominal computed tomography (arterial phase) showing typical and strongly enhancing carcinoid liver metastasis. Panels B, C and D: cardiac computed tomography; four-chamber view at diastole (Panel B) and systole (Panel C) showing dilatation of the right-sided chambers and an important thickening of the tricuspid valve and subvalvular apparatus, with incomplete tricuspid closure during systole. Note the pericardial effusion (Panel D, arrow). Panels E and F: cardiac computed tomography; multiplanar reconstructions centred on the pulmonary valve during diastole, demonstrating an important leaflet thickening and retraction with incomplete valve closure.

Cardiac surgery was indicated due to clinical symptoms (massive pulmonary and tricuspid regurgitation). Surgery was performed after contrast-enhanced TTE, which did not disclose PFO. The tricuspid and pulmonary valves were replaced by bioprostheses. All findings were confirmed by surgery, and pathological examination found extensive leaflet fibrosis. Six months after cardiac surgery, cardiac follow-up was unremarkable. The patient was awaiting liver transplantation.

Primitive carcinoid tumours are slow-growing neoplasms that produce vasoactive substances, including serotonin. Fibrotic valve injuries occur only in cases of serotonin secretion by the liver metastasis. Right-sided heart valve dysfunction is the most frequent manifestation due to the pulmonary inactivation of tumour secretion. Left-sided heart valve disease occurs in only 15% of cases, usually the consequence of PFO that permits the tumour secretions to cross over from the right-sided to the left-sided chambers, hence avoiding pulmonary inactivation. Less frequent cardiac manifestations include pericardial effusion, coronary vasospasm or cardiac metastases of the carcinoid tumour. Surgical indication is based on clinical evaluation and quantification of valve regurgitation by TTE, which remains the first-line examination in this indication (Appendix A. Video 1 and 2).

Conflict of interest

None.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.acvd.2010.03.011.